

Steadily increasing seizures of cocaine moving toward or in Europe reflect an upward trend in drug use—they have risen almost uniformly from an average of less than 5 metric tons during 1986-89 to an average 25 metric tons per year during 1990-99. Last year a record 47 metric tons of cocaine were seized in the European corridor—including 9 metric tons seized in the Caribbean en route to Europe.

Wholesale and street prices also reflect a more dynamic cocaine market in Europe.

- Cocaine that sells at US ports-of-entry for \$12,000 to \$15,000 per kilogram typically goes for \$17,000 to \$22,000 in Spain. Part of the price difference reflects higher costs associated with more complex smuggling operations via commercial and noncommercial maritime shipments. Some of the price differential is probably caused by the more dynamic demand for cocaine in Europe than in the United States.

Rapidly Rising Latin Demand

Latin America is apparently now the most dynamic cocaine market. On the basis of analyses of drug surveys, CNC estimates that Latin Americans consume about 100 to 145 metric tons of cocaine (including cocaine hydrochloride [HCl] and cocaine base) each year. In addition, CNC estimates that Latin Americans in Peru, Bolivia, Argentina, and Colombia chew enough coca leaf to account for another 35 to 55 metric tons of cocaine.¹⁰

The most significant Latin American cocaine-consuming nations are those that produce cocaine or those whose territory is normally exploited to take it to other world markets.

- On the basis of national household survey data, we estimate that the consumption of cocaine HCl and base in the producing countries of Peru, Bolivia, and Colombia combined is about 30 to 40 metric tons per year.
- No comparable consumption data are available for Brazil, but CNC conservatively estimates that Brazilians consume 35 to 50 metric tons of cocaine,

making that country the largest user of cocaine in Latin America, and the second-largest user—besides only the United States—in the world.

- On the basis of drug-use surveys, CNC estimates that transit zone consumers (mostly in Mexico and Central America) consume between 15 tons and 25 metric tons of cocaine each year.
- Latin Americans in Peru, Bolivia, Argentina, and Colombia consume coca leaf but no significant coca leaf chewing is reported elsewhere.

Prevalence rates are highest in cocaine production countries; recent surveys indicate cocaine use rates in Colombia, Peru, and Bolivia are only slightly behind those in the United States. While use rates are lower in Central America, Mexico, and some Caribbean countries, some countries there appear to be experiencing faster growth.

- National-household surveys indicate that past-month consumption of cocaine HCl and cocaine base more than doubled in Bolivia and Peru during 1992-98. Comparative data is not available for most other countries, but school surveys and interviews with health and law enforcement officials indicate that similar rates of increase in cocaine consumption occurred in Argentina, Brazil, Colombia, and Mexico.

National prevalence data indicate that almost 1 million Latin American adults used cocaine HCl or cocaine base on a past-month basis during 1998.

Indications of Cocaine Use in Other Markets

CNC estimates that cocaine consumption in other markets is an estimated 35 to 55 metric tons, with two-thirds of that accounted for by just four countries: Canada, Nigeria, Australia, and South Africa.

Consumption appears to be rising in several countries where cocaine has not previously been a public health threat, notably in Nigeria, Australia, South Africa, Israel, and Japan, according to international press reports. Recent unprecedented cocaine seizures provide dramatic evidence that consumption is growing.

¹⁰ The volume of coca leaf use is converted to cocaine HCl equivalence by calculating the volume of leaf needed to produce a metric ton of cocaine HCl.

Figure 6: Purity Ranges for Seized Cocaine^a

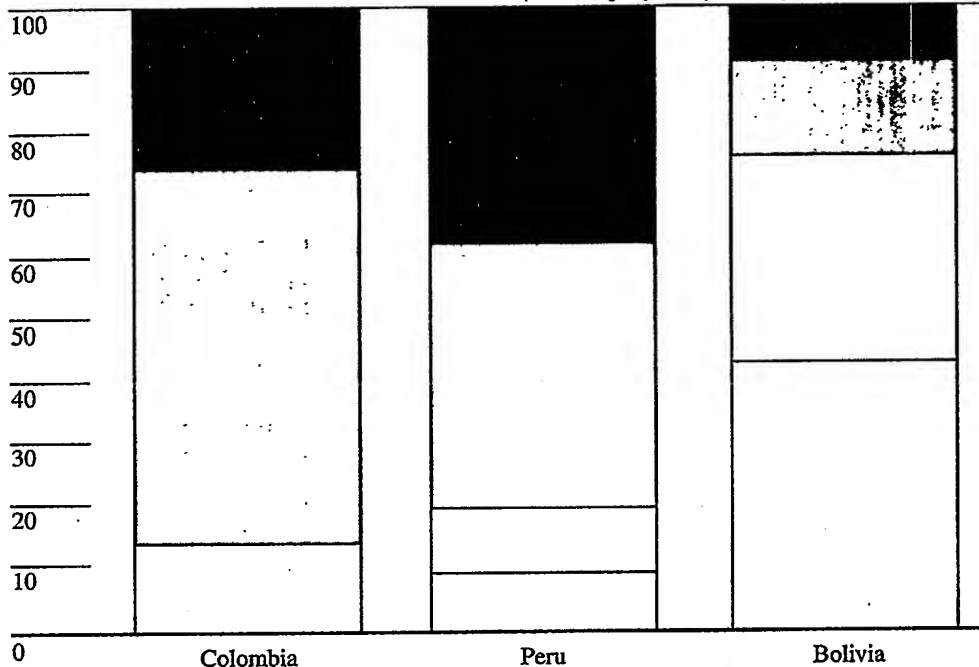
(Number of samples per range per country)

Purity Range	Colombia	Peru	Bolivia	Total
Greater than 90 percent	8	21	4	33
80 to 90 percent	19	24	9	52
70 to 79 percent	4	6	18	28
Less than 70 percent	0	5	24	29
Total samples	31	56	55	142

The Purity of Export-Quality Bolivian Cocaine is Lower Than Colombian or Peruvian Cocaine

Greater than 90 percent
 80-90 percent
 70-79 percent
 Less than 70 percent

(Percentage by Purity Level of Seizures at HCl Labs)



^aData from DEA Special Testing and Research Laboratory 1999 Report on cocaine HCl exhibits seized at 142 labs.

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Less source zone consumption: 120 to 175

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Cocaine potentially departing source zone: 415 to 745

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Less transit zone seizures: 50 to 60

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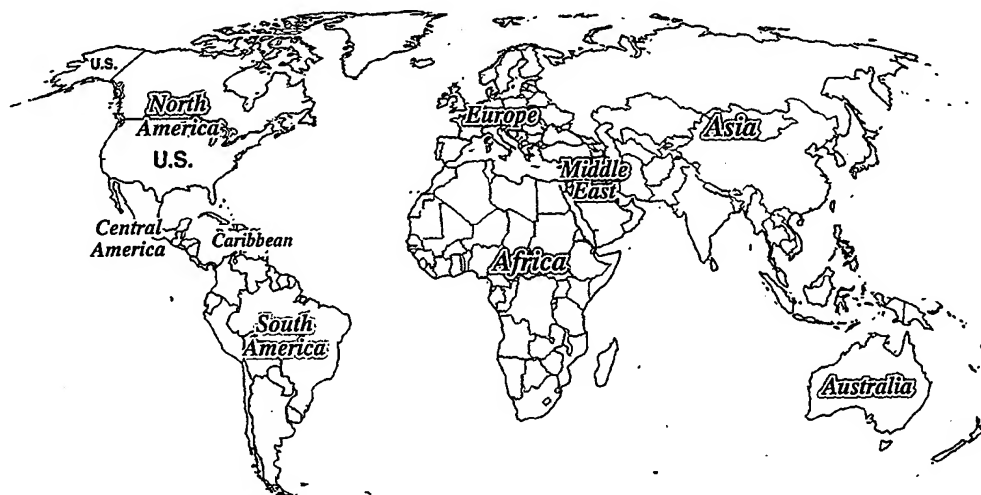
Less transit zone consumption: 15 to 25

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Figure 1
Cocaine: Source, Transit, Arrival, and Nonarrival Zones ☐

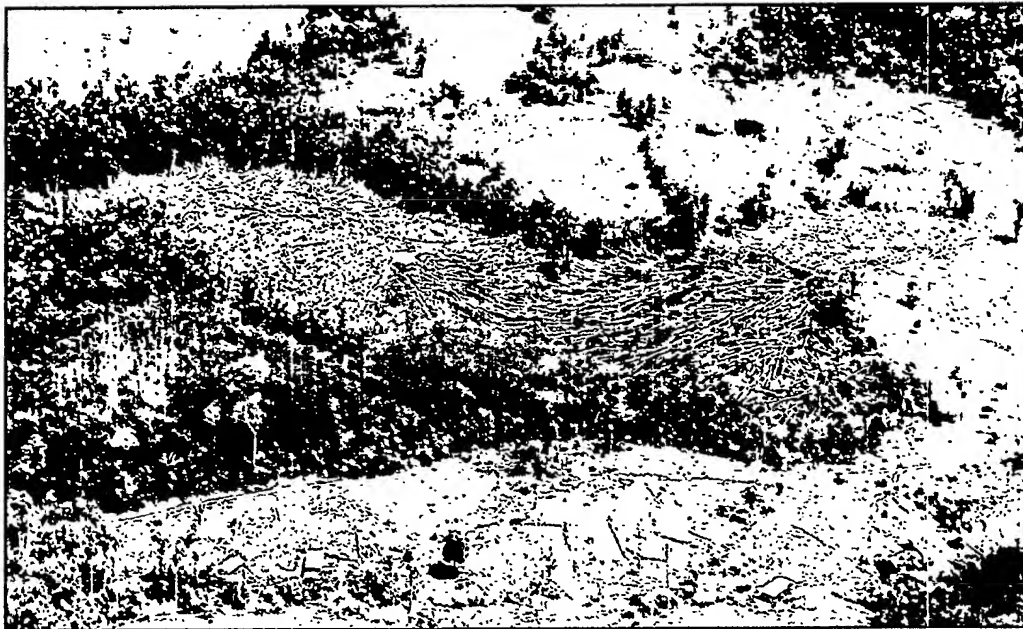
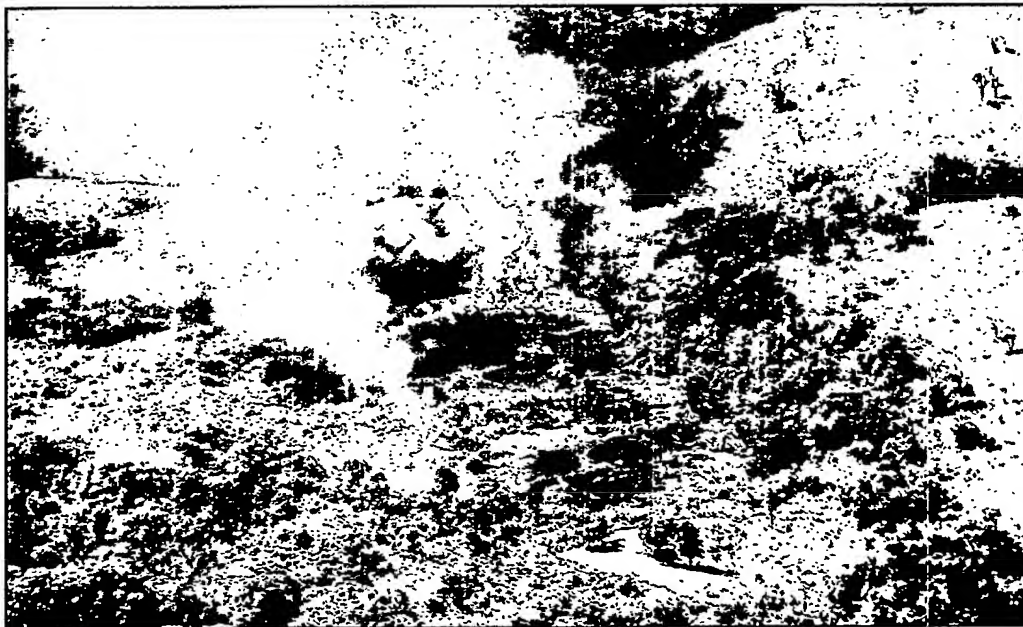


- ☐ Source zone
- ☐ Transit zone
- ☐ Arrival zone (the US including Puerto Rico and the US Virgin Islands)
- ☐ Non-US arrival zone

Boundary representation is
not necessarily authoritative.

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Figure 3



Coca farmers in the Putumayo Department of southern Colombia are cutting and burning virgin forests to expand coca cultivation. After the trees are cut, farmers burn the fields to clear the underbrush before planting coca.

The Cultivation Estimate: Knowing Where To Look

A successful sample survey will depend on correctly defining the areas in which the crop is grown—this type of information is developed and/or refined during the presurvey analysis phase of the estimate to reduce error. The results of prior imagery surveys, evaluated in conjunction with intelligence from other sources, often provide the basis of this information. In addition, discussions with in-country personnel and travel to the area are also included as part of the presurvey analysis. In countries where the crop is expanding rapidly, like Colombia, we take extra care to ensure that our potential growing areas are properly defined.

Each year CNC conducts several imagery-based probes or explorations [redacted]

[redacted] in order to identify, confirm, or deny the emergence of new growing areas or to refine the boundaries of traditional growing areas. [redacted]

[redacted]

Uncertainties in Potential Production Estimate

The amount of potential cocaine produced from the crop is a softer number than the cultivation estimate, mostly because processing conversion factors for Colombia have not yet been fully estimated and because the aggressive chemical control program in Bolivia may have reduced the processing efficiency there. Processing efficiencies for Colombia are being determined through farmer surveys and sophisticated analyses of leaf-to-base processing laboratory operations.

- Preliminary information indicates that Colombian cocaine base processors extract between 60 and 75 percent of all cocaine alkaloid. An accurate measure of average processing efficiency, however, will not be available until mid-to-late 2000 when ongoing laboratory analyses have been completed.

Coca leaf yield estimates and cocaine alkaloid content are also sources of some uncertainty. Nevertheless, coca alkaloid content and average harvests have been established for Bolivia and Peru and some growing areas in Colombia by scientific studies based on leaf collection, infield measurements, and farmer surveys.

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Seizure Estimates

Analyses of event-based data show that reported worldwide seizures totaled 286 metric tons of "export-grade" cocaine during 1999.⁵ Aggregate seizure levels are virtually the same as those attained during each of the previous three years. Seizures in the source and transit zones have been steady; seizures in the United States have fallen somewhat; while seizures in the non-US arrival zone—principally Europe—are up substantially.

- Event data show 77 metric tons of "export-grade" cocaine base and hydrochloride (HCl) were seized in the source zone during 1999, roughly the same amount as during 1996-98.⁶
- Seizures of export-grade cocaine in the transit zone were 74 metric tons during 1999, virtually the same as the average during 1996-98. US interdiction forces were directly responsible for some 50 metric tons of cocaine seized in the transit zone.
- During 1999, US law enforcement interdicted 56 tons of cocaine arriving in the United States and at least 31 metric tons moving inside the country.
- Total seizures moving to or in the non-US arrival zone doubled to 48 metric tons from the 1996-98 average. Most of the increase was accounted for by 18 metric tons of high-seas seizures from the China Breeze and Castor in May in the Caribbean by US and British ships and from the Tammsaare near the Canary Islands by Spanish authorities.

Seizure Uncertainties

There are uncertainties associated with seizure statistics.

- The amount of pure cocaine contained in most seizures is unknown. Cocaine HCl typically departs source zone laboratories at purity levels of 80 to 90 percent (see figure at left). The closer a cocaine

⁵ Numerous small volume street-level cocaine seizures are never reported.

⁶ Source zone countries also regularly seize coca leaf intended for the illicit market. The amount of coca leaf seized, however, is rarely enough to produce significant amounts of cocaine.

shipment gets to the street the more susceptible it is to purity cuts by wholesalers and other middlemen. As a result, a reported 10-metric-ton seizure may have contained only less than 8 or 9 metric tons of pure cocaine once the weight of adulterants and packaging material was discounted from the reported tonnage.

- An undetermined, but possibly significant, amount of seized cocaine reenters the system due to theft or corrupt practices, which are well-known as widespread problems across many regions of the world.⁷

Measuring Uncertainties

Assessing these uncertainties to determine how much cocaine is actually taken out of the system, analysts judge that reported global seizures in 1999 of 286 metric tons represent a range of 200 to 240 metric tons of pure cocaine. Analysts have established this range on the basis of assumptions they believe reflect the trends and variables associated with seizures, but there is insufficient information to determine the accuracy of this range.

- Of the 286 metric tons of cocaine seized, 199 metric tons were seized in the source, transit, and non-US arrival zones. Analysts believe that a relatively small portion of that, roughly 20 to 40 metric tons, reenters trafficking routes due to theft or corruption by foreign officials. As a result, analysts believe only 246 to 266 metric tons of "export-grade" cocaine were actually seized and destroyed.
- Because DEA data indicate that most "export-grade" cocaine is 80- to 90-percent pure, analysts believe that those seizures actually removed roughly 200 to 240 metric tons of pure cocaine from the system.⁸

⁷ The percent of cocaine reentering the system can be defined as the "coefficient of corruption." While many foreign law enforcement agencies have excellent anticorruption records, a few have been less successful in overcoming trafficker influences. Analysts believe that a relatively small portion of the estimated range of seized cocaine reenters the system in the source, transit, and non-US arrival zones. It is not appropriate for the Intelligence Community to comment on corruption in the United States.

⁸ In recent years, Bolivian cocaine purity, on average, has been lower, but most of Bolivia's lowest quality cocaine probably does not make it to markets outside South America.

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Table 1
Worldwide Cocaine Base and HCl Seizures

(Metric tons of "export-quality" cocaine)

	1996	1997	1998	1999
Worldwide	265	288	303	286
Source zone	75	81	90	77
Transit zone	53	86	81	74
US arrival	85	54	66	56
US nonborder seizures	29	30	36	31
Non-US arrival	23	37	30	48

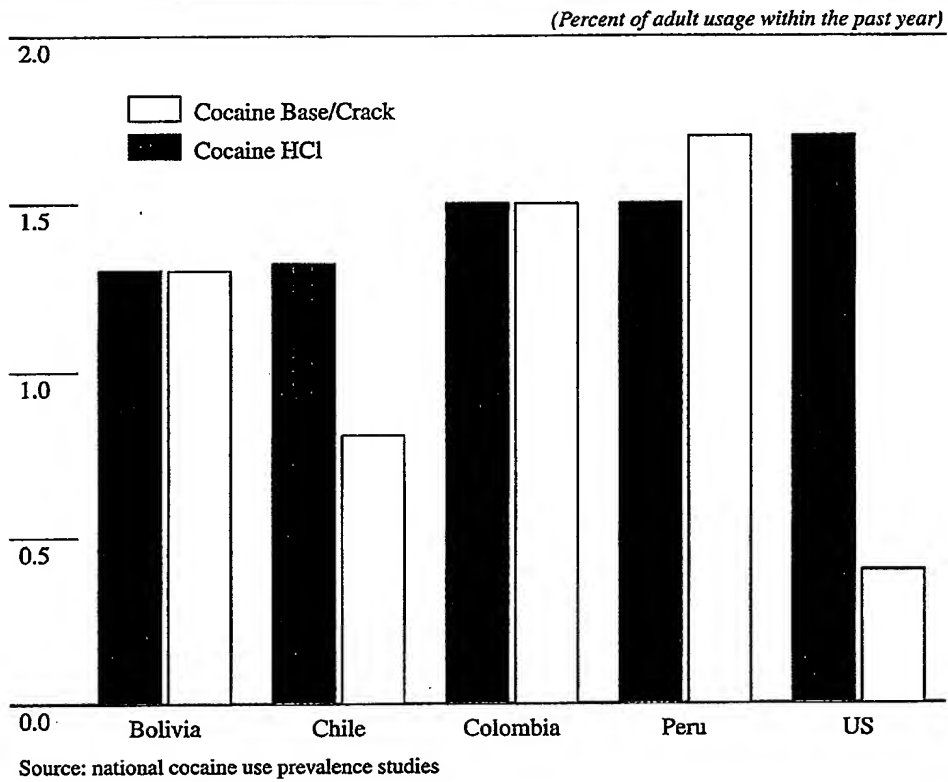
Figure 5



Rural mobile police in Bolivia use trained dog to search a truck arriving in Guayaramerin, Bolivia, on the border with Brazil.

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**Figure 8: Cocaine Use in Parts of Latin America
Approaching US Level**



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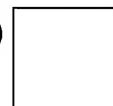
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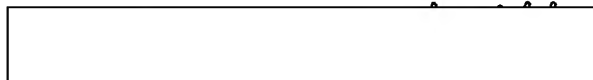
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Cocaine: A Global Accounting for 1999



A Joint Intelligence Report



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CNC 2000
April 2000



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Cocaine: A Global Accounting for 1999

A Joint Intelligence Report

This report was prepared jointly by analysts from the
DCI Crime and Narcotics Center (CNC) and the
Defense Intelligence Agency.

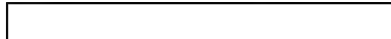
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Independent estimates of cocaine flow and consumption—including detected transit zone flow estimates provided by the Interagency Assessment of Cocaine Movement and worldwide cocaine consumption estimates—fall within the ranges of this assessment and thus appear generally consistent with these supply-side estimated ranges.

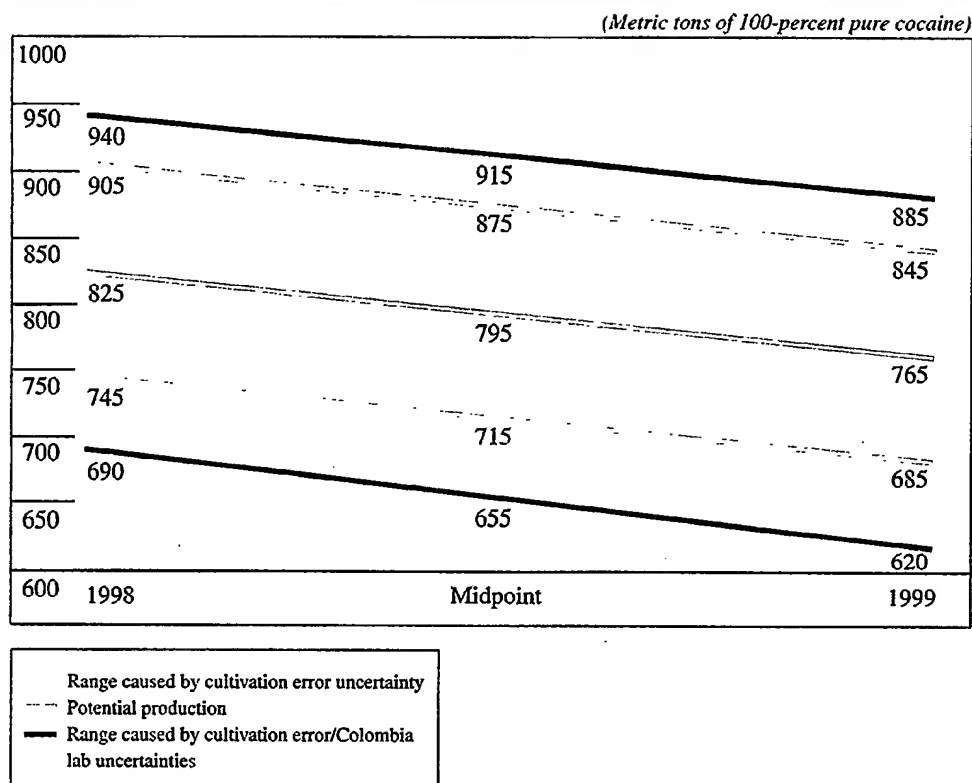
Surveys taken by the US Department of Health and Human Services during the last 10 years indicate that cocaine use in the United States has stabilized and may have fallen somewhat. Even so, US consumers use more cocaine than any others. While cocaine use in the United States has apparently flagged, cocaine-use surveys show consumption elsewhere has been rising steadily, especially in Europe and Latin America.

- The European market, collectively, is the second largest in the world.
- Latin America is not far behind. Recent surveys indicate that the percentage of adults that used cocaine in the past year and past month in Colombia, Peru, and Bolivia are similar to the share of adults that did so in the United States.
- CNC conservatively estimates Brazilians consume between 35 and 50 metric tons of pure cocaine each year, making that country the largest user of cocaine in Latin America and the second-largest user in the world—besides only the United States.



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Figure 4: Andean Potential Cocaine Production: 1998-99



Average Potential Cocaine Production: A Simple Model

Average potential cocaine production for any given year can be modeled by estimating variances in key variables and adjusting for year-to-year changes in productive capacity.

Because the imagery-based cultivation estimate is statistically based, the standard error of the estimate can be determined to establish a range for potential cocaine production.

- The standard error for the narcotics cultivation estimate generally averages about 10 percent. This 10-percent error can then be extrapolated to our estimate of potential cocaine production at yearend.⁴

⁴ The 10-percent standard error of the crop estimate is apportioned equally about the midpoint of the cultivation estimate to establish the range, for lack of a scientific basis to specify the range. CNC analysts, however, believe that it is more likely that the estimate understates the range, but more research is needed to quantify that range.

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Information Gaps/Research Plan

More accurate information is needed to tighten estimated ranges of cocaine production, seizures, and consumption.



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Information From the Interagency Assessment of Cocaine Movement

For 1999, the Interagency Assessment of Cocaine Movement (IACM) estimates that detected cocaine flows to global markets is relatively unchanged. The assessment indicates that 587 metric tons of "export quality" (80- to 90-percent pure) or about 500 metric tons of pure cocaine (100-percent pure) were detected departing South America for world markets.

- The IACM assessment is fully consistent with this assessment's estimated lower-end range of 415 to 745 metric tons of 100-percent pure cocaine (equivalent to 490 to 880 metric tons of 80- to 90-percent export-quality cocaine) available to depart the source zone.*
 - Since IACM flow analysis began in 1996, the annual amount of cocaine detected departing the source zone has been between 500 to 600 metric tons of "export-quality" cocaine. The IACM has acknowledged that more cocaine departs than is detected, especially commercial maritime movement to Europe and the United States and noncommercial maritime movement through the Eastern Pacific to Mexico. For example, in 1999, about 75 metric tons of cocaine were detected departing South America for non-US markets, primarily Europe, yet the actual flow to Europe is estimated between 150 and 200 metric tons. It is estimated that at least 700 to 800 metric tons of "export-quality" cocaine actually depart South America, a range that is consistent with the upper-end range of this assessment's 490 to 880 metric tons of "export-quality" cocaine available to depart the source zone.*
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Cocaine: A Global Accounting for 1999 ☐

Key Judgments

*Information available
as of 31 March 2000
was used in this report.*

This assessment estimates the amounts of cocaine available for export from the source zone and for consumption in the arrival zones by analyzing separate estimates of potential cocaine production, worldwide seizures, and source and transit zone consumption. Estimated ranges are used in this estimate, because multiple uncertainties do not allow the confident use of point estimates.

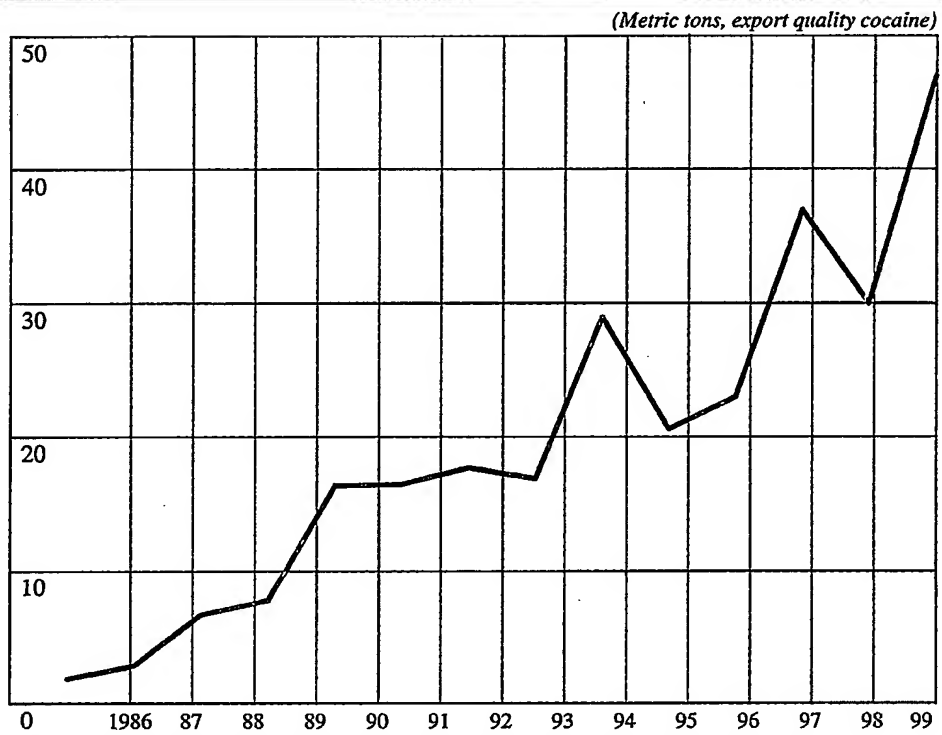
- The best estimate for potential production for all of 1999 is the average of yearend potential for 1998 and the yearend potential for 1999. The estimated range for average potential Andean cocaine production for 1999 is 655 to 915 metric tons of 100-percent pure cocaine.
- Authorities seized a reported 286 metric tons of "export-quality" cocaine during 1999; but only an estimated 200 to 240 metric tons of 100-percent pure cocaine were taken out of the system after adjusting for purity and corruption.
- Cocaine and coca leaf consumption in the source and transit zones for 1999 were the equivalent of an estimated 135 to 200 metric tons of 100-percent pure cocaine—including the equivalent of 35 to 55 metric tons from coca leaf chewing.

After subtracting cocaine seized and consumed in the source zone, about 415 to 745 metric tons of 100-percent pure cocaine (roughly 490 to 880 metric tons of 85-percent "export-quality" cocaine) were available for export from the source zone during 1999.¹ Further deduction for cocaine consumed in the transit zone and seized in the arrival zones indicates that as much as 580 metric tons of pure cocaine were available for arrival markets, mostly in the United States and Europe, last year.

- Consumption studies indicate 280 to 320 metric tons of cocaine are probably consumed each year in the United States. That would leave as much as 300 metric tons of pure cocaine available for other world markets, with most of that consumed in Europe but other lesser amounts consumed in Canada, Nigeria, South Africa, and Australia.
- Stable worldwide consumer price and purity levels indicate that there was no shortage of cocaine to the world market last year.

¹ All assumptions used to determine these ranges are detailed in appendix B.

Figure 7: Cocaine Seizures in Europe Corridor



Source: Data from CCDB and European Monitoring Center for Drugs and Drug Addiction.

Figure 9



This outdoor market in San Francisco, Ayacucho, Peru, sells coca leaf for chewing. Many Indian men and women in Peru, Bolivia, and Colombia chew coca nearly every day. In northern Argentina, chewing is also popular among the non-Indian population.

- The seizure in late January of nearly a half ton of finished cocaine from a yacht off the coast of Australia underscores what health officials in that country say is a growing level of cocaine abuse.
- Though much smaller, the record Chinese seizure of 95 kilograms of cocaine in Guangdong Province in October also underscored the possible expansion of Asian/Pacific markets.

Cocaine consumption has been substantial for some time in Canada. CNC currently estimates annual cocaine use in Canada at 15 to 20 metric tons.

Our analysis of prevalence and seizure data in Africa, the Middle East, and Asia/Pacific indicates that cocaine

use in those areas is 20 to 35 metric tons, much lower than in the Americas or Europe but is rising.

- Africa consumes about half of that. Most of that consumed in Nigeria and South Africa, which both report relatively high cocaine-use statistics.
- The Middle East, Asia, and the Pacific as a group consume about as much as Africa, with most of that being used in Australia, China (including Hong Kong), and Japan. Australia is the only country other than the Americas, Europe, and Africa that reports significant cocaine use figures.

Consumption Estimates

The United States continues to be the single-largest market for cocaine, but its share of global consumption is apparently shrinking. In contrast to the United States, cocaine use in Europe, Latin America, Africa, and the Pacific Rim has risen substantially in recent years. Collectively, consumers in non-US markets—including those in Latin America—probably account for more cocaine each year than do cocaine users in the United States.

Cocaine-use data are generally not available for 1999. Accordingly, this assessment uses 1998 numbers as a conservative estimate for cocaine consumption in 1999.

Cocaine Use Relatively Steady in the United States

Cocaine-use data and seizure statistics indicate that the US market for cocaine has remained fairly steady during the 1990s. The number of past-year cocaine users in the United States fell from an annual average 5.0 million during 1990-92 to 3.8 million in 1998, but the number of past-month users—which account for the lion's share of overall cocaine use—rose slightly from an annual average 1.7 million during 1990-92 to 1.8 million in 1998.⁹

Cocaine seizures in the United States are down slightly, tending to corroborate steady-to-lower cocaine use.

- During 1991-96, average Federal seizures inside the United States—both at the point of arrival and moving within the country—were some 127 metric tons per year.
- During 1997-99, average Federal seizures inside the United States dropped to 97 metric tons.

⁹ Data from Summary of Findings from the 1998 National Household Survey on Drug Abuse, Substance Abuse and Mental Health Services Administration, US Department of Health and Human Services.

Abt Associates, in work contracted by the Office of National Drug Control Policy, estimates total cocaine consumption in the United States during the 1990s ranged from 280 to 320 metric tons of 100-percent pure cocaine each year.

- Using a demand-side methodology, Abt Associates studied cocaine users' spending patterns and estimated that US cocaine consumption remained relatively steady during 1991-97, when Abt estimated an average 297 metric tons per year of cocaine were consumed in the United States. For 1998, Abt Associates demand-side methodology indicated a point estimate of 291 metric tons of cocaine were used by US consumers.

Europe Cocaine Market Maturing

European cocaine consumption—including both West and East Europe—is second only to that in the United States and growing.

- While no comprehensive studies of Europe have been cited, most European law enforcement officials and health experts, largely on the basis of seizure trends, now estimate the European market at between 100 and 150 metric tons of cocaine each year.

CNC estimates that Europeans consume about 115 to 170 metric tons of cocaine each year. Using European cocaine prevalence data and conservative assumptions about average use, CNC estimates that cocaine users in Western Europe consume approximately 100 to 145 metric tons of cocaine. Cocaine users in Eastern Europe and the former Soviet Union probably consume another 15 to 25 tons.

In sharp contrast to the United States, drug use and seizure data indicate that cocaine consumption in Europe has expanded substantially during the past decade. CNC evaluation of national surveys and interviews with prominent health and law enforcement officials in Western and Eastern Europe indicate that approximately 1.2 million Europeans used cocaine on a past-month basis during 1998.

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Cocaine: A Global Accounting for 1999 ☐

Supply-Side Model for Estimating Cocaine Availability

This assessment uses an estimated range of potential Andean cocaine production to assess how much cocaine is available for world markets. Seizures and consumption in the source and transit zones are subtracted from production estimates to derive the amount of cocaine potentially available to leave the source zone and arrive at world markets.²

- The potential cocaine production range is developed from the potential productive capacities of the three Andean countries—Colombia, Peru, and Bolivia—where virtually all coca is cultivated and cocaine processed.

- The seizure range is developed from all reported incidents in the source, transit, and arrival zones, including cocaine reported to federal authorities that was seized inside the United States after it had crossed the border. Street-level seizures are not reported and thus not included in the estimate.
 - Ranges for the consumption of coca leaf, cocaine base, and cocaine hydrochloride (HCl) in the source and transit zones are estimated on the basis of CNC's evaluation of drug-use statistics. (See appendix A for cocaine consumption methodology.)
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² Analysts do not believe traffickers manage strategic inventories to affect year-to-year cocaine availability.

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Estimated consumption in rest of world: 150 to 225

The CNC worldwide cocaine estimate indicates that the rest of the world, notably Europe and Canada, consumed an estimated 188 metric tons of cocaine in 1998. The 1999 estimate assumes that the amount consumed in 1999 is plus or minus 20 percent of the 1998 estimate, or 150.4 to 225.6, which is rounded for 150 to 225 metric tons.

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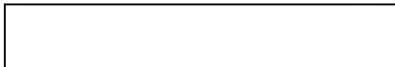
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Scope Note

This assessment is the first comprehensive attempt at a global accounting for the international cocaine trade. It responds to an action item from the Counternarcotics Interagency Working Group and the April 1999 quarterly J-3/USIC (United States Interdiction Coordinator) conference, which requested the drug intelligence community to develop a consensus on the amount of cocaine potentially available to world markets. This assessment is essentially a comprehensive, all-source quantitative analysis of the consistency of CNC and Interagency estimates of cocaine production, movement, and consumption. The assessment was requested to help senior US policymakers better formulate international drug policy and counterdrug programs.

CNC has coordinated this project, but the development of the assessment involved the extensive partnership with the drug intelligence community concerning all aspects of the analysis. The participating agencies believe this assessment is the most comprehensive available. Nevertheless, they understand that significant areas of uncertainty remain. As a result, an important part of this effort has been to identify data and process shortfalls and collection gaps. This assessment will be updated as appropriate to incorporate additional research to further limit the uncertainties involved in this estimate.



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Appendix B

Assumptions for Calculating the Ranges

The calculation of cocaine available for world market (in metric tons) in 1999 is determined by comparing production, seizure, and source and transit zone consumption estimates.

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Average potential Andean cocaine production: 655 to 915

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Less source zone seizures: 50 to 65

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It is then possible to look at the range of consecutive years' potential production estimates (for this case, the years 1998 and 1999) and assume a linear relationship between the two years. If only the standard error for cultivation is considered, the best estimate of average potential production would be 715 to 875 metric tons.

Uncertainty associated with base lab processing efficiencies in Colombia, however, also needs to be considered. Studies of yields and base lab efficiencies have already been completed for Peru and Bolivia. While preliminary results of base lab processing efficiencies in Colombia suggest that efficiencies are in the 70-percent range, they have yet to be scientifically measured. Until those measurements are complete, sometime in early summer, this assessment assumes that average cocaine base lab processing efficiencies in Colombia are between 60 and 75 percent.

- If both the standard error for cultivation and a 15-percentage point uncertainty around Colombian base lab processing efficiencies are considered, then the estimate for average potential cocaine production in the Andean region for 1999 ranges between 655 and 915 metric tons, with the best estimate remaining at 795 metric tons.

Signs of Possible Production Shortages

Although measures of consumer markets for 1999 do not reflect any change in the supply of cocaine, signs of potential shortages may be appearing at the cultivation level in Bolivia and Peru where eradication efforts have cut into productive capacity.

- The average coca price at the farm gate in Peru jumped to \$2.40 per kilogram in 1999, an increase of 140 percent over the 1995-98 average level. Coca prices soared to \$5 a kilogram in Bolivia by the end of the year, more than double the previous high.
- Presumably to ensure adequate productive capacity, coca cultivation continues to soar in Colombia; and for the first time in years, modest amounts of new coca cultivation were observed in Peru last year.

Seizure Accounting

Seizure statistics for 1998 and 1999 come from the interagency's Consolidated Counterdrug Database (CCDB), which monitors all reported seizure events. Most seizure data for the CCDB come from reporting of seizure events by open sources or through official sources. Verification of foreign-supplied data is usually not possible, but care is taken to evaluate each specific event in part to guard against double counting. US seizure data are provided by law enforcement agencies and reported through El Paso Intelligence Center databases.

During 1999, after adjusting for purity and corruption, the 286 metric tons of "export-quality" cocaine seized is roughly equivalent to 200 to 240 metric tons of 100-percent pure cocaine. The estimate assumes that cocaine seized averages between 80- and 90-percent pure cocaine and that a relatively small amount of the cocaine seized reenters the system.

- *After adjusting for purity and corruption in the source, transit, and non-US arrival zone, the 151 metric tons of cocaine seized in 1999 in the source and transit zones is the equivalent of 97 to 122 tons of 100-percent pure cocaine; and the 48 metric tons of cocaine seized in the non-US arrival zone is equivalent to 33 to 41 metric tons of 100-percent pure cocaine.*
 - *After adjustments for purity, the reported 87 metric tons of cocaine seized in the United States is estimated at 70 to 78 tons of 100-percent pure cocaine.*
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Consumption Uncertainties

Of the key factors needed to estimate international cocaine availability and distribution, consumption estimates are the most imprecise. Prevalence and average-use parameters, which are the key values for determining consumption, are difficult to estimate. Cocaine-use estimates for 1998 are available for the United States, many Latin American and European countries, and some other countries, but most countries have not completed prevalence studies. Where such surveys exist, they are often several years old. More scientific studies are needed to estimate more accurately the user and addict populations and how much the different populations consume.

- To compensate for increased uncertainty, our estimates use ranges that are plus and minus 20 percent of point estimates, which is believed wide enough to cover the probable range.*
 - To avoid overstating worldwide consumption, this assessment uses unadjusted 1998 estimates as proxies for the 1999 consumption numbers.*
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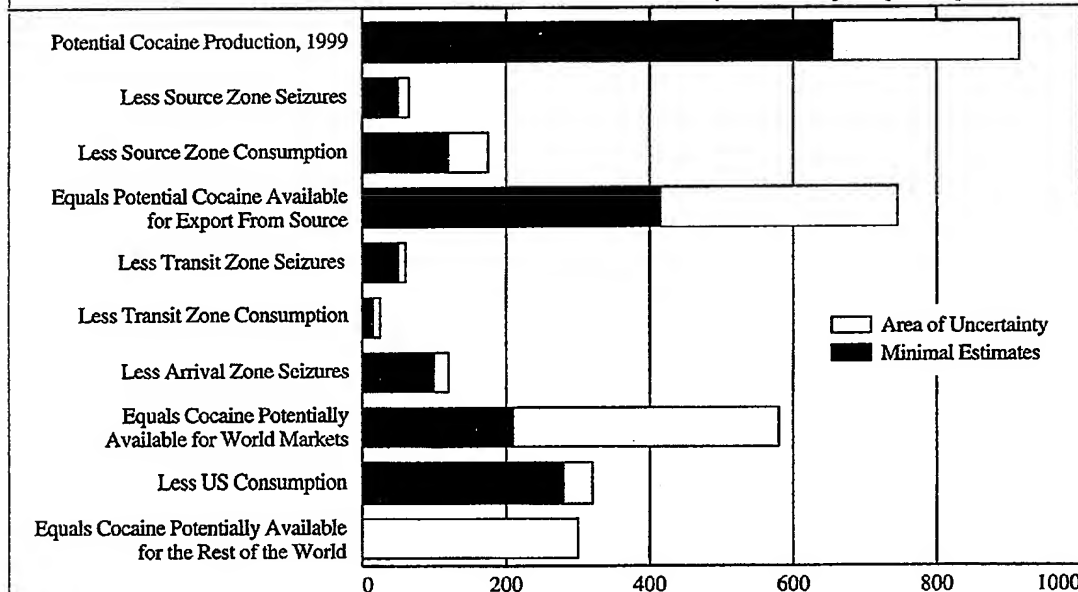
Figure 2: Estimating Cocaine Available for World Markets, 1999

(Metric tons of 100-percent pure cocaine)

Average potential Andean cocaine production:	655 to 915
Less source zone seizures	50 to 65
Less source zone consumption	120 to 175
Cocaine potentially departing source zone:	415 to 745
Less transit zone seizures	50 to 60
Less transit zone consumption	15 to 25
Less arrival zone seizures	100 to 120
Cocaine potentially available for world markets:	210 to 580
Less estimated US consumption	280 to 320
Cocaine available for the rest of the world:	As much as 300
Estimated consumption in rest of world:	150 to 225

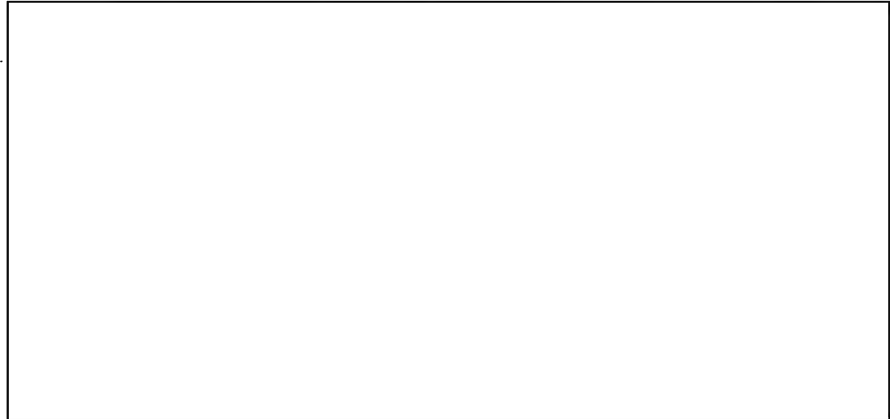
Cocaine Availability and Distribution, 1999

(Metric tons of 100-percent pure cocaine)

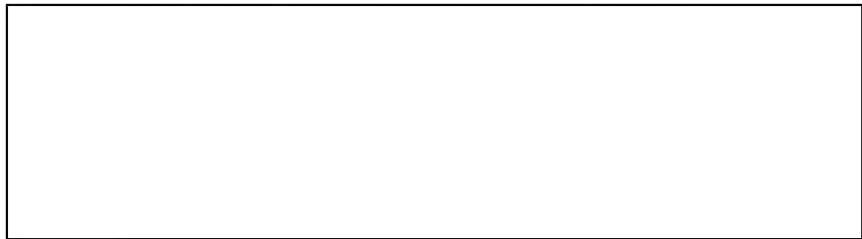


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Less arrival zone seizures: 100 to 120



Cocaine potentially available for world markets: 215 to 580



Less estimated US consumption: 280 to 320



Cocaine available for the rest of the world: as much as 300

Cocaine potentially available for the rest of the world is equal to the total available for world markets less that used in the United States.

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Table A-1
Cocaine-Use Rates ^a

(percent of adults who have consumed cocaine in past year)

		1992	1993	1994	1995	1996	1997	1998	1999
South America									
Argentina	Cocaine HCl			0.5					1.2
	Base or crack							0.3	
Bolivia	Cocaine HCl	0.2				1.5		1.3	
	Cocaine base	0.3				1.7		1.3	
Brazil							0.7		
Chile	Cocaine HCl		0.9		0.8		1.3		
	Cocaine base		0.9		0.6		0.8		
Colombia	Cocaine HCl					0.8	1.5		
	Cocaine base (basuco)					1.5			
Ecuador						0.6			
Peru	Cocaine HCl		0.5		0.2		1.5		
	Cocaine base		0.8		0.7		1.7		
Venezuela				0.3					
Mexico								0.45	
Central America									
Costa Rica							0.2		
El Salvador				0.6					
Guatemala				1.4					
Honduras							1.0		
Nicaragua									
Panama							1.0		
Caribbean									
The Bahamas				0.4					
Dominican Republic					0.7				
Jamaica					0.9				
Saint Lucia					0.1				
Europe									
Austria								0.5	
Belgium								0.5	
Denmark				0.3					
Finland								0.2	
France					0.2				
Germany (West)					0.9		0.7		
Germany (East)				0.2		0.1			
Italy						0.6			
Liechtenstein						0.2			
Netherlands						0.9	0.7		
Portugal					0.2				
Spain					1.5		1.6	1.5	
Switzerland					0.6				
United Kingdom				0.5		0.5			
Others									
Canada						0.7			
Australia					1.0				
Nigeria				1.0					
Croatia							0.1		
Ghana							0.1		
Kenya					0.1				
United States (any cocaine)		2.1	1.9	1.7	1.7	1.9	1.9	1.7	
Of which crack cocaine		0.6	0.7	0.6	0.5	0.6	0.6	0.4	

^a From national survey results or estimates by United Nations Drug Control Program.

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Coca Cultivation and Potential Cocaine Production Estimates

CNC analysts judge that average potential production of Andean cocaine ranged from 655 to 915 metric tons of pure cocaine in 1999. Yearend 1999 potential production capacity was 765 metric tons, down from 825 metric tons at the end of 1998. Our best estimate for average productive capacity for the year as a whole was 795 metric tons, the average of yearend potential in 1998 and 1999. The estimated range for potential production reflects the average standard error around the cultivation estimate and uncertainty around Colombian base lab processing efficiencies.

The estimate for total Andean potential cocaine production has declined 18 percent since 1995 due to successful counternarcotics programs, particularly eradication programs in Peru and Bolivia. Traffickers prevented a steeper decline in production by boosting cultivation and productive capacity in Colombia from about 25 percent of Andean coca and cocaine in 1995 to about 70 percent in 1999.

- While productive capacity declined during 1995-99, the actual amount of coca leaf harvested and cocaine produced during those years may have remained stable or even risen somewhat. It is possible actual production as a percentage of potential capacity was lower in the mid-1990s when there were fewer eradication and interdiction pressures on the industry and higher in more recent years as Andean coca growers intensified exploitation of fewer fields in response to increasing world demand.

Potential Cocaine Production Methodology

The US Government's coca cultivation and potential cocaine production estimates are made up of two science-based components—CNC's imagery-based estimate of the area under cultivation and DEA's estimate of cocaine yield from cultivated fields.

- Cultivation estimates are based on a sampling methodology—the same proven methodology used to estimate legal crops and forestry in

the United States and elsewhere. Because the methodology has been used consistently for more than a decade, the estimates provide a reliable assessment of strategic trends.

- Cultivation estimates have the advantage of estimating supplies at the only time in the cultivation-to-street process when drugs are not hidden to avoid detection.

Potential cocaine production at the end of each calendar year is an estimate of the amount of cocaine that could be produced from estimated net cultivation. CNC uses a formula containing yield and processing conversion factors, based on DEA scientific research and analysis, to make these estimates. Potential cocaine production is the most accurate representation of how year-to-year changes in net cultivation affect cocaine production. It assumes that mature coca fields at the end of the year were productive throughout the year and that all coca leaf was harvested and processed into finished cocaine. It is an estimate of the amount of 100-percent pure cocaine that could be produced from the area under cultivation.

- Potential production is not the same as actual production. Actual production is impacted by variations in weather, the timing of planting, harvesting, eradication, and market demand.³
- Cocaine HCl typically departs laboratories at purity levels of 80 to 90 percent. As a result, 795 metric tons of 100-percent pure potential cocaine would be contained in 880 to 990 metric tons of "export-quality" cocaine.

³ Because potential production measures yearend capacity, average potential cocaine production for any year could be higher or lower. The difference between the yearend and average measures will depend, in large part, on the rate of change of potential production from one year's yearend estimate to the next. In general, if net cultivation increases during the year, then actual average potential production would be lower than the yearend estimate. Alternatively, if net cultivation is falling, then actual average potential production would be greater than the yearend estimate.

Appendix A

Cocaine Consumption Methodology

CNC analysts and contractors reviewed country studies and interviewed a wide range of people, from drug experts to addicts, in 32 countries in Europe, Latin America, and Asia to research non-US narcotics consumption trends during 1998-99. As a result CNC has gained an initial understanding of global consumption trends, insight into prevalence rates, and non-US consumption profiles that can provide the analytic framework for making meaningful assessments of international consumption.

CNC has adopted a straightforward model developed by USAID in Bolivia to assess non-US consumption trends. Specifically, the volume of cocaine hydrochloride (HCl) and base/crack consumed in each country in Latin America is estimated by multiplying the total number of heavy, moderate, and recreational users by an estimate of the average amount they consume in each year.

- National survey data are used—when available—to determine the number of cocaine users. The number of cocaine users in other countries is conservatively estimated by comparing their populations to similar countries for which survey data exists. Detailed drug-use surveys from Argentina, Bolivia, Chile, Mexico, Peru, and Spain were used to evaluate drug-use patterns.

- Because there are no accurate data on addicts or their consumption rate for estimating consumption in Europe, analysts agree that average cocaine-use profiles approximate the midpoint between users in the United States and Latin America, based on the relative maturity of the various market and comparable disposal incomes.
- Estimates for cocaine-use profiles in countries in the rest of the world were mainly based on the lowest consumption profiles estimated for cocaine users in Latin America.